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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/668,304	09/24/2003	Hidetoshi Watanabe	116790	2400

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EXAMINER	
MRUK, GEOFFREY S	
ART UNIT	**PAPER NUMBER**
2853	

DATE MAILED: 03/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/668,304	WATANABE ET AL.	
	Examiner	Art Unit	
	Geoffrey Mruk	2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 September 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9 October 2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

Figures 1A and 1B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6, 10-16, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Hasegawa (US 6,276,781 B1).

With respect to claim 1, Hasegawa discloses an inkjet head (Figure 1), comprising:

- a cavity plate (Figure 3, element 106) having a plurality of pressure chambers (Figure 3, element 103) arranged in matrix (Column 2, lines 15-18);
- a piezoelectric sheet (Figure 3, element 112) laminated on said cavity plate;
- a plurality of driving electrodes (Figure 3, element 113) formed on said piezoelectric sheet at positions corresponding to said pressure chambers;
- a plurality of first contact lands (Figure 2B, element 115) extending from respective ones of said driving electrodes, each of said first contact lands being located in a vicinity of corresponding one of said driving electrodes (Column 5, lines 52-65); and
- a power supply board (Figure 2B, element 107) having a plurality of second contact lands (Figure 2B, element 125) formed at positions corresponding to said first contact lands (Figure 2B, elements 115, 125), said second contact lands being connected with respective ones of said first contact lands for power supply (Column 9, lines 44-64).

With respect to claim 2, Hasegawa discloses the first contact lands (Figure 2B, element 115) are formed so as to protrude from said piezoelectric sheet (Interface between elements 113 and 115 in Figure 2B).

With respect to claim 3, Hasegawa discloses the second contact lands (Figure 2B, element 125) are formed so as to protrude (Column 5, lines 55-67; Column 6, lines1-13) from said power supply board (Figure 2B, element 107).

With respect to claim 4, Hasegawa discloses the first contact lands (Figure 2B, element 115) are formed in more than two tiers (Interface between elements 113 and 115 of Figure 2B; Interface between elements 115 and 125 of Figure 2B).

With respect to claim 5, Hasegawa discloses the first contact lands (Figure 2B, element 115) includes a first level portion (Interface between elements 113 and 115 of Figure 2B) higher than said driving electrode (Figure 2B, element 115) and a second level portion (Interface between elements 115 and 125 of Figure 2B) higher than said first level portion, said first level portion being formed between said second level portion and said driving electrode.

With respect to claim 6, Hasegawa discloses the second level portion (Interface between elements 115 and 125 of Figure 2B) is formed out of areas of said piezoelectric sheet (Figure 2B, elements 112, 113) defined directly above said pressure chambers (Figure 2A, element 103).

With respect to claim 10, Hasegawa discloses the piezoelectric sheet (Figure 2B, element 112) has at least one positioning mark (Figure 2B, element 113 geometry) that assists in positioning of said power supply board (Figure 2B, element 107) on said piezoelectric sheet such that said plurality of first contact lands (Figure 2B, element 115) make contact with said plurality of second contact lands (Figure 2B, element 125; Column 7, lines 6-35).

With respect to claim 11, Hasegawa discloses the power supply board (Figure 2B, element 107) has at least one positioning mark (Figure 2B, element 124) that assists in positioning of said power supply board on said piezoelectric sheet (Figure 2B, element 112) such that said plurality of first contact lands (Figure 2B, element 115) make contact with said plurality of second contact lands (Figure 2B, element 125; Column 7, lines 6-35).

With respect to claim 12, Hasegawa discloses an inkjet head (Figure 1), comprising:

- a body having a plurality of pressure chambers (Figure 3, element 103) arranged in matrix (Column 2, lines 15-18);
- a piezoelectric sheet (Figure33, element 112) attached on said body;
- a plurality of driving electrodes (Figure 3, element 113) formed on said piezoelectric sheet at positions corresponding to said pressure chambers; and
- a plurality of first contact lands (Figure 2B, element 115) extending from respective ones of said driving electrodes, each of said first contact lands being located in a vicinity of corresponding one of said driving electrodes (Interface between elements 113 and 115 in Figure 2B), said first contact lands being to be connected with respective ones of second contact lands (Interface between elements 115 and 125 in Figure 2B) of a printed board for power supply (Column1, lines 37-62).

With respect to claim 13, Hasegawa discloses the first contact lands (Figure 2B, element 115) are formed so as to protrude from said piezoelectric sheet (Interface between elements 113 and 115 in Figure 2B).

With respect to claim 14, Hasegawa discloses the first contact land (Figure 2B, element 115) is formed in more than two tiers (Interface between elements 113 and 115 of Figure 2B; Interface between elements 115 and 125 of Figure 2B).

With respect to claim 15, Hasegawa discloses the first contact lands (Figure 2B, element 115) includes a first level portion (Interface between elements 113 and 115 of Figure 2B) higher than said driving electrode (Figure 2B, element 113) and a second level portion (Interface between elements 115 and 125 of Figure 2B) higher than said first level portion, said first level portion being formed between said second level portion and said driving electrode.

With respect to claim 16, Hasegawa discloses the first contact lands (Figure 2B, element 115) are formed out of areas of said piezoelectric sheet (Interface between elements 113 and 115 in Figure 2B) defined right above said pressure chambers (Figure 2A, element 103).

With respect to claim 20, Hasegawa discloses piezoelectric sheet (Figure 2B, element 112) has at least one positioning mark (Figure 2B, element 113 geometry) that assists in positioning of the printed board (Figure 2B, element 107) on said piezoelectric sheet such that said first contact lands come into contact with the second contact lands (Figure 2B, element 125; Column 7, lines 6-35).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 7-9 and 17-19 are rejected under 35 U.S.C. 103(a) as being obvious over Hasegawa (US 6,276,781 B1) in view of Sakaida et al. (US 6,808,254 B2).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned

by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

With respect to claims 7-9 and 17-19, Hasegawa discloses the claimed invention with the exception of the driving electrodes have a substantially rhombus form, having a pair of acute angle corners and a pair of obtuse angle corners, where the driving electrodes are arranged such that the acute angle corners of one driving electrode is located between the acute angle corners of other driving electrodes adjacent to one driving electrode.

Sakaida discloses the drive electrodes (Figure 9, element 36) are shaped similar to, but slightly smaller than, the projected shape of the parallelogram-shaped ink pressure chambers (Figure 9, element 17c), thus forming the acute and obtuse angles. Also, Sakaida discloses the driving electrodes (Figure 7, element 36) are arranged such that the acute angle corners of one driving electrode is located between the acute angle corners of other driving electrodes adjacent to one driving electrode.

At the time of the invention, it would have been obvious for a person of ordinary skill in the art to use the parallelogram shaped electrodes of Sakaida in the printer head of Hasegawa. The motivation for doing so would have been for the benefit of large and efficient pressure fluctuation in the pressure chambers of Hasegawa.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Koga et al. discloses writing electrodes that are in the shape of a

parallelogram (claim 2) for the prevention of image defects due to linear strains (column 19, lines 53-65). However, the writing electrodes are not disclosed for the use in a piezoelectric actuator of an inkjet printer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Geoffrey Mruk whose telephone number is (571) 272-2810. The examiner can normally be reached on 7am - 330pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

GSM
2/23/2005

GM

MANISH S. SHAH
PRIMARY EXAMINER